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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/534,530 | 05/12/2005 | Takashi Enoki | L9289.05134 | 7018 |

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| EXAMINER | |
|---|---|
| TRAN, CHUC | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2821 | |

DATE MAILED: 09/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/534,530 | ENOKI ET AL. | |
| | Examiner | Art Unit | |
| | Chuc D. Tran | 2821 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *6-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-10 and 15* is/are rejected.

7)☒ Claim(s) *11-14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/12/05,06/14/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/JP03/14562, filed on November 17, 2003.

### *Oath/Declaration*

The specification to which the oath or declaration is directed has not been adequately identified. See MPEP § 602.

### *Claim Objections*

2. Claims 7-9 and 11-14 are objected to because of the following informalities:

Claim 7, line 1, "claim 1" should be changed to - - claim 6 - -;

Claim 8, line 1, "claim 2" should be changed to - - claim 7 - -;

Claim 9, line 1, "claim 3" should be changed to - - claim 8 - -;

Claim 11, line 1, "claim 5" should be changed to - - claim 10 - -;

Claim 12, line 1, "claim 6" should be changed to - - claim 11 - -;

Claim 13, line 1, "claim 6" should be changed to - - claim 11 - -;

Claim 14, line 1, "claim 6" should be changed to - - claim 11 - -.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caille et al (USP. 5,206,655) in view of Epp et al (USP. 6,369,759).

Regarding claims 6 and 8-9, Caille disclose an active antenna having a multilayer structure in Fig. 9 comprising:

- an antenna substrate (34) on which an antenna (36) is disposed (Fig. 9);

- a circuit substrate (47) on which an amplification circuit (35) for a signal transmitted/received through said antenna (Caille, Col. 7, Line 6). However, Caille do not goes to details of a heat radiation plate interposed between said antenna substrate and said circuit substrate, wherein said heat radiation plate includes a communication hole that communicates said antenna substrate side with said circuit substrate side. Epp disclose in Fig. 1, the heat radiation plate (106) with a thickness (Epp, Fig. 1) interposed between said antenna substrate and said circuit substrate, wherein said heat radiation plate includes a communication hole (slot-shaped) (102) (Epp, Fig. 1) that communicates said antenna substrate side with said circuit substrate side (Epp, Col. 3, Line 45). Thus, it would have bee obvious to one having ordinary skill in the art to modify the Caille's antenna system by providing the heat radiation plate interposed between said antenna substrate and said circuit substrate as taught by Epp. The ordinary artisan would have been motivated to modify Caille's antenna system in the manner described above for reducing the heat generated from the amplification circuit (Epp, Col. 4, Line 1).

Regarding claim 7, Caille disclose in Fig. 9 that the antenna (36) is disposed apart from said communication hole on said antenna substrate and is supplied power from said communication hole through a feed line (65) (Caille, Fig. 9).

Regarding claim 10, Caille disclose an active antenna in Fig. 23, comprising:

an antenna (36); a high-output amplifier (42) that amplifies a signal and outputs the signal to said antenna (Caille, Abstract) (Fig. 5);

- a low-noise amplifier that amplifies the signal received by said antenna (Abstract) (Fig. (Fig. 5);

- an antenna substrate (34) that includes said antenna (36) and a feeder circuit (65) that feeds power to said antenna (Fig. 9);

- an RF substrate (47) that is mounted with said high-output amplifier (42)and said low-noise amplifier (44) which are active devices (35) (Fig. 5 and Fig. 9). However, Caille do not goes to details of a heat radiation block inserted between said antenna substrate and said RF substrate, wherein said antenna substrate and said RF substrate are connected through an electromagnetic field by a connection slot. Epp disclose in Fig. 1, the heat radiation block (106) inserted between said antenna substrate and said RF substrate, wherein the antenna substrate and said RF substrate are connected through an electromagnetic field by a connection slot (102 (Epp, Fig. 1) (Epp, Col. 3, Line 45). Thus, it would have bee obvious to one having ordinary skill in the art to modify the Caille's antenna system by providing the heat radiation block interposed between said antenna substrate and said RF substrate as taught by Epp. The ordinary artisan would have been motivated to modify Caille's antenna system in the manner described above for reducing the heat generated from the RF circuit (Epp, Col. 4, Line 1).

Claim (method) 15, given the apparatus of an active antenna as applied to claims 6-14 (apparatus), the method for the apparatus as claimed in claim 15 is inherent.

Regarding claim 15, Caille disclose an active antenna manufacturing method in Fig. 9 comprising:

- a step of forming a multilayer structure comprising an antenna substrate (34) on which an antenna (36) is disposed (Fig. 9), a circuit substrate (47) on which an amplification circuit (35) for a signal transmitted/received through said antenna (Caille's Abstract). However, Caille do not goes to details of a step of providing a heat radiation plate provided with a slot-shaped through hole interposed between said antenna substrate and said circuit substrate. Epp disclose in Fig. 1, the step of providing a heat radiation plate (106) provided with a slot-shaped through hole (102) interposed between said antenna substrate and said circuit substrate (Epp's Fig. 1). Thus, it would have bee obvious to one having ordinary skill in the art to modify the Caille's antenna system by providing the heat radiation plate provided with a slot-shaped through hole interposed between said antenna substrate and said circuit substrate as taught by Epp. The ordinary artisan would have been motivated to modify Caille's antenna system in the manner described above for reducing the heat generated from the RF circuit (Epp, Col. 4, Line 1).

***Allowable Subject Matter***

5. Claims 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

Prior art fails to disclose a splitter that splits a signal into as many signals as said

antennas and outputs the signals to said high-output amplifier; and a combiner that combines the signals received by said antennas and outputs the combined signal to said low-noise amplifier, wherein signals are spatially combined in claim 11.

Claims 12-14 are allowed since they are dependent on claim 11.

***Citation of relevant prior art***

Prior art Upton (USP. 5,289,142) disclose transmit/receive switch for phased array antenna.

Prior art Nagata et al (USP. 6,239,656) disclose power amplifier.

Prior art Long (USP. 6,026,286) disclose RF amplifier, RF mixer and RF receiver.

Prior art Nysen et al (USP. 6,611,224) disclose backscatter transponder interrogation device.

Prior art Lloyd et al (USP. 6,850,746) disclose mixer circuit with on-chip transformer.

Prior art Epp et al (USP. 5,907,305) disclose dual polarized, heat spreading rectenna.

***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuc D. Tran whose telephone number is (571) 272-1829. The examiner can normally be reached on M-F Flex hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy P. Callahan can be reached on (571) 272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC
September 21, 2006

THO PHAN
PRIMARY EXAMINER